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EXAMINER	
KALIVODA, CHRISTOPHER M	
ART UNIT	**PAPER NUMBER**
2883	

DATE MAILED: 06/14/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/655,236	LI, RUOLIN	
	Examiner	Art Unit	
	Christopher M. Kalivoda	2883	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *21 March 2005*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-30* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-30* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *21 March 2005* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments filed March 21, 2005 have been fully considered but they are not persuasive. With respect to the double patenting rejection under 35 USC 101, using the claim set as amended on 5/2/05 for application 10/425,279, the parent case for this application, the examiner respectfully disagrees. The amended claims now constitute obvious double patenting with the current application.

With respect to the argument that Henry teaches an "elastomeric material ... and has an effective index that is dependent upon the length of the elastomeric section that replaced the corresponding waveguide core section", the examiner respectfully disagrees. Firstly, examiner notes that the term "elastomeric" means a polymer that that is elastic and the invention uses polymer materials to change the refractive index. Secondly, the structure as claimed is present in Henry et al. and the device is thus capable of having an effective index that is dependent

Double Patenting

The nonstatutory double patenting rejection is based on a judicially created doctrine grounded in public policy (a policy reflected in the statute) so as to prevent the unjustified or improper timewise extension of the "right to exclude" granted by a patent and to prevent possible harassment by multiple assignees. See *In re Goodman*, 11 F.3d 1046, 29 USPQ2d 2010 (Fed. Cir. 1993); *In re Longi*, 759 F.2d 887, 225 USPQ 645 (Fed. Cir. 1985); *In re Van Ornum*, 686 F.2d 937, 214 USPQ 761 (CCPA

1982); *In re Vogel*, 422 F.2d 438, 164 USPQ 619 (CCPA 1970);and, *In re Thorington,* 418 F.2d 528, 163 USPQ 644 (CCPA 1969).

A timely filed terminal disclaimer in compliance with 37 CFR 1.321(c) may be used to overcome an actual or provisional rejection based on a nonstatutory double patenting ground provided the conflicting application or patent is shown to be commonly owned with this application. See 37 CFR 1.130(b).

Effective January 1, 1994, a registered attorney or agent of record may sign a terminal disclaimer. A terminal disclaimer signed by the assignee must fully comply with 37 CFR 3.73(b).

Claims 1-30 are provisionally rejected under the judicially created doctrine of obviousness-type double patenting as being unpatentable over claims 1-30 of copending Application No. 10/425,279.

Although the conflicting claims are not identical, they are not patentably distinct from each other because claims 1 and 2 of the above cited application appears to claim the same limitations of claim 1 of the current application. While the reference does not specifically state "a waveguide cladding comprising first and second material", the limitation "... having an effective refractive index that is dependent upon a portion of an area of a side of the second material coplanar with and existing within a cross-section of only a portion of an optical mode surrounding a waveguide core" implies the second material is in the cladding since the cladding surrounds the core.

This is a provisional obviousness-type double patenting rejection because the conflicting claims have not in fact been patented.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1-4, 7, 8, 16, 17, 24, 25 and 27-29 are rejected under 35 U.S.C. 102(b) as being anticipated by Henry et al., U.S. Patent 6,137,939.

Regarding independent claim 1, Henry et al. teach an apparatus comprising a wave guide clad comprising a first material (col 4, line 8-10 and Fig 1b, ref sign 16 where the first material is silica) whose refraction index varies by a first magnitude according to a temperature variation of the first material and a second material (col 6, lines 55-57 and Fig 1b, ref sign 20 where the second material is an elastomer) whose refraction index varies by a second magnitude according to a temperature variation of the second material, the second magnitude being inversely related to the first magnitude (col 4, lines 60-64).

While the reference does not specifically state "the waveguide clad having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core, the structure as claimed is present and the

device is capable of having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding independent claims 8 and 16, Henry et al. teach an apparatus comprising a first means comprising two materials (a first material, col 4, line 8-10 and Fig 1b, ref sign 16 is silica and the second material, col 6, lines 55-57 and Fig 1b, ref sign 20 is an elastomer) each having a refraction index to change in opposite magnitude in relation to the other in response to variations in temperature of the waveguide (col 4, lines 60-64).

While the reference does not specifically state stabilizing a light's wavelength as in claim 8 or stabilizing a light's phase as in claim 16, the structure as claimed is present in Henry et al. and the device is thus capable of stabilizing a light's wavelength or phase since it is independent of temperature (col 4, lines 17-20). Also, while the reference does not specifically state "the waveguide clad having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core, the structure as claimed is present and the device is capable of having an effective refraction index that is dependent upon a portion of the area of a side of the second material coplanar with and existing within a cross section of only a portion of an

optical mode surrounding a waveguide core (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding independent claim 24, Henry et al. teach a system comprising a light source to emit a spectrum of light wavelengths (col 1, lines 26-30); a wave guide to guide light from the light source having a first wavelength (Fig 5a, ref sign 130), the wave guide comprising a clad material (col 4, line 8-10 and Fig 1b, ref sign 16), the wave guide including a polymer to help maintain an effective wave guide refraction index within an optical mode of the waveguide (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) that is independent of temperature changes in the wave guide (col 4, lines 17-20).

While the reference does not specifically state "the effective waveguide refraction index being dependent upon a portion of the area of a side of the polymer coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core, the structure as claimed is present and the device is capable of having the effective waveguide refraction index being dependent upon a portion of the area of a side of the polymer coplanar with and existing within a cross section of only a portion of an optical mode surrounding a waveguide core (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding claims 2 and 25, the first magnitude contributes to an increase in the refraction index of the first material in response to the temperature variation and the second magnitude contributes to a decrease in the refraction index of the second

material in response to the temperature variation since silica has a positive dn/dT (col 4, lines 29-31) and the elastomer moves in the opposite direction (col 4, lines 60-64).

Regarding claim 3, there is a source for producing light (col 1, lines 26-30).

Regarding claims 4 and 29, there can also be a grating (col 7, lines 59-61) since Bragg-filters are also contemplated.

Regarding claim 7, while the reference does not specifically state "the effective refraction index equal to a first sum of the products of the coplanar cross-sectional areas of the second material existing within the optical mode and the refraction index of the second material, the core and the refraction index of the core, the first material and the refraction index of the first material, the first sum being divided by a second sum of the cross-sectional areas of the second material existing with the optical mode, the core and the first material, the structure as claimed is present and the effective refraction index is capable of being equal to a first sum of the products of the coplanar cross-sectional areas of the second material existing within the optical mode and the refraction index of the second material, the core and the refraction index of the core, the first material and the refraction index of the first material, the first sum being divided by a second sum of the cross-sectional areas of the second material existing with the optical mode, the core and the first material.

Regarding claim 17, one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) distributed in segments along the length of the waveguide core within the waveguide (Fig 5a, ref sign 20).

Regarding claims 27 and 28, while the reference does not specifically state the phase of the light is substantially independent of temperature as in claim 27 or the wavelength of the light is substantially independent of temperature as in claim 28, the structure as claimed is present in Henry et al. and the device is thus capable of having the wavelength and phase independent of temperature (col 4, lines 17-20) (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claims 5, 6, 9-15, 18-21 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939.

Regarding claim 5, Henry et al. teach the limitations of claim 1 as described above. However, the reference is silent with respect to the polymer existing within the grating area.

Henry et al. teach that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists within the grating area

The motivation is to make the grating independent of temperature as well (col 4, lines 17-20).

Regarding claim 6, Henry et al, teach the limitations of claim 1 as described above. However, the reference is silent with respect to the first and second material contributing to an effective refraction index of the wave guide clad.

The structure as claimed is present in Henry et al. and the first and second material are thus capable of contributing to an effective refraction index of the wave guide clad since the device is independent of temperature (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claims 12 and 13, while the reference does not state a second means for stabilizing the phase of light across varying temperatures of the waveguide wherein the means comprises the two materials in proportionate amounts so as to make a round trip refraction distance of a photon of the light substantially independent of temperature, the structure as claimed is present in Henry et al., and the device is thus capable of making a round trip refraction distance of a photon independent of temperature for the purpose of stabilizing phase (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Regarding claim 14, one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer) and one is a clad.

Regarding claims 15 and 18, while the reference is silent with respect to the effective index for the waveguide being dependent upon the product of length of a polymer segment and refraction index of the polymer, the reference does teach that the

refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides (longer lengths). The structure as claimed is present in Henry et al. and the effective refraction index thus depends on the product of the length of the polymer segment and the refraction index of the polymer (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997)).

Regarding claim 19, the effective index of refraction is substantially constant since the structure as claimed is present in Henry et al.

Regarding claims 20 and 21, the light source can be external to the waveguide (col 1, lines 26-30) since the light is launched into a separate/distinct input ports.

Claims 9–11 and 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939. Regarding claims 9 and 26, Henry et al. teach the limitations as described above.

While the reference is silent with respect to variations in the light's wavelength in response to temperature variations of the waveguide depending on the relative amounts of the first and second materials within the optical mode of the wave guide clad, Henry et al. do teach the refraction index varies on the relative amounts (col 4, lines 64-67 and col 5, lines 13-18) and more polymer should be used in the longer waveguides.

Therefore, variations in the light's wavelength response to temperature variations of the waveguide depend on the relative amounts

Regarding claim 10, the one of the two materials is a polymer (col 6, lines 55-57 and Fig 1b, ref sign 20 where an elastomer is a type of polymer).

Regarding claim 11, Henry et al. teach the limitations of the claims as described above.

However, the reference is silent with respect to the polymer existing at opposite ends of a grating within the wave guide clad.

Henry et al. teach that Bragg filters (gratings) can benefit from the aspects of the invention (col 7, lines 59-61).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. such that the polymer exists on opposite ends of a grating within the waveguide clad.

The motivation is for making the grating independent of temperature as well (Henry et al., col 4, lines 17-20).

Claims 22-23 and 30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Henry et al., U.S. Patent 6,137,939 in view of Tanaka et al., U.S. Patent 6,320,888.

Regarding claims 22 and 30, Henry et al. teach the limitations as described above. However, the reference is silent with respect to the light source being a semiconductor optical amplifier (SOA) chip.

Tanaka et al, describes a frequency stabilized laser using a SOA chip (col 12, lines 10-17).

Therefore, it would have been obvious to one skilled in the art at the time the invention was made to modify the invention of Henry et al. in view of Deacon to include a light source which is a semiconductor optical amplifier (SOA) chip

The motivation is to amplify multiplexed light (col 12, line 16).

Regarding claim 23, while the references are silent with respect to the wavelength corresponding to the max power within the emission spectrum, the structure as claimed is present as described above and the device is thus capable of having the wavelength correspond to the maximum power within the emission spectrum of the SOA. (See In re Swinehart, 169 USPQ 226 (CCPA 1971); In re Schreiber, 44 USPQ2d 1429 (Fed. Cir. 1997).

Conclusion

Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of

the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Christopher M. Kalivoda whose telephone number is (571) 272-2476. The examiner can normally be reached on Monday - Friday (8:30 - 5:00). If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank G. Font can be reached on (571) 272-2415. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Cmk
06/07/05

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